Summary of Major Changes to Specifications

Item 300, "Asphalts, Oils, and Emulsions"

1. Added reference for sampling and testing requirements.
2. Added a table describing acronyms.
3. Asphalt Cements.
   a. Added AC-0.6 from Special Provision.
   b. Deleted AC-20 and AC-30.
4. Polymer Modified Asphalt Cements.
   a. Deleted description of latex additive.
   b. Deleted AC-10 w/3% latex and AC-10 w/3% latex (High Viscosity Blend). These are for HMAC and were replaced by PG binders.
   c. Added AC-15P and AC-20-5TR from Special Provisions.
   d. Change in AC-15P to remove the low temperature ductility requirement and substitute elastic recovery at a minimum of 55%.
5. Medium Curing Cutback Asphalt.
   Deleted RC-70 for lack of use.
6. Special Use Cutback Asphalt.
   Added SCM I and SCM II from the stockpile patching mix specification. This will enable the materials portion to be removed from these specifications. Also, eliminated the ductility requirement on the distillation residue because it cannot be performed properly.
7. Emulsified Asphalt.
   a. Combined High Float Anionic Emulsions and other anionic emulsions.
   b. Eliminated RS-2 and RS-2H due to lack of use. HFRS-2 has replaced these products. Suppliers do not make them for TxDOT use anymore.
8. Cationic Emulsified Asphalt.
   a. Increased Demulsibility of CRS-2 and CRS-2H from 40 to 70. This is a response to field trouble and a request from Brownwood District. Test results showed that this would not be a problem except for the one supplier that had field problems last construction season.
   b. Decreased minimum penetration on CRS-2H and CSS-1H from 80 to 70 as per comment from AEMA and Brownwood District Special Provision. Main effect is to allow a lower pen (harder material) for use in summer.
9. Polymer Modified Emulsified Asphalt.
   a. Consolidate all polymer modified emulsified asphalt (These are anionic) from spec book and special provisions.
   b. Lowered minimum Pen on HFRS-2P from 100 to 90 at request of AEMA.
   c. Increase Demulsibility of HFRS-2P from 40 to 50, at the request of Brownwood District. This is the same problem they had for the CRS-2P. There should be no effect on producers, except where field problems existed. Brownwood suggested demul of 70, but supplier concerns of using enough emulsifying agent to get the float and demul together resulted in selection of 50 instead.
10. Polymer Modified Cationic Emulsified Asphalt.
    a. Consolidate specs from special provisions.
    b. Increase CRS-2P demulsibility from 40 to 70 and decrease minimum pen from 100 to 90 as per AEMA and Brownwood District. Changed Elastic Recovery from 60% to 55% for uniformity with other similar materials.
11. Added separate section for Crumb Rubber Modifier with more generic gradations and allowance for gradations specified on the plans or as approved.
12. Added Polymer Modified Asphalt Emulsion Crack Sealer. This is currently in a Special Specification used by maintenance. They can now refer to this spec for materials properties.

13. Rubber Asphalt Crack Sealer.
    a. Deleted rubber properties.
    b. Added Class B, which is currently defined in GSD spec.
14. Eliminated Fluxing Material
    a. Flux oil - eliminated for lack of use.
    b. Aromatic oil - eliminated for lack of use.
    c. Flux oil may be defined in a general sense in the LRA spec. This material is a specialty product and Vulcan currently makes a product that does not necessarily meet the spec in the 1993 book. We have not tested this product for about 10 years.
15. Deleted Special Precoat Material for lack of use.
16. Deleted Cracked Fuel Oil. Atlanta District wanted to keep this, but we have not tested any product in about 10 years. They may use a Special Specification if they ever want to use it again.
17. Recycling Agent and Emulsified Recycling Agent. Deleted requirements for blending with a Standard Aged binder. The standard binder used is no longer a specified product. We want the binder to rejuvenate the binder to what may be specified in plans, such as a PG 64-22. The specifics should be detailed in specific project plans, not as a general spec requirement.
18. Added Specialty Emulsions. These are products currently described in special provisions.
19. Added Asphalt-Rubber Binders. These are the products for Asphalt-Rubber surface treatments (Item 318) or HMA (Special Specs). We refer to them according to the ASTM spec and not describe the rubber used. ASTM does not require specific gradations of rubber.
20. Performance Graded Binders. Added PG binders from Special Provision, but added an additional Elastic Recovery requirements for all PG binder with temperature range greater than 92C.
21. Added table describing Typical Material Uses. This may aid designers, Area Engineers, and Contractors in the selection of materials.
22. Storage, Heating, and Application Temperatures. Modified some temperatures at the request of THMAPA and Houston District. Modifications were to lower the maximum allowable and storage maximum for some binder to 350EF. Polymer modified surface treatment binders remain at 375F maximum for spray application.

Item 301, "Asphalt Antistripping Agents"

1. Removed references to moisture susceptibility tests and requirements for those tests. These should be specified in the Item governing the mixture.
2. Incorporated existing Special Provisions to include the various ways lime can be added at the plant, but allow district to specify a method if desired.

Require steps be taken to avoid the loss of lime in the exhaust air stream. Drum Mix plants either use a bag house dust collector and feed dust back into the plant or the mixture is subject to testing using the design moisture susceptibility test procedure on production mix, before placement.

Item 302, "Aggregates for Surface Treatments"

1. 302.2.A. Removed definition of lightweight and referred to Tex 100-E Procedure for definitions.
2. 302.2.A. Added provisions for Surface Aggregate Classification.
3. 302.2.A. Table 2. Combined Lightweight gradations with standard aggregate gradations changed some of the spec values.
4. 302.2.A. Table 2. Re-labeled modified gradations with S suffix.
5. 302.2A. Table 2. Changed #10 sieve to #8 sieve to match HMA sieve sizes.
6. 302.2.A. Table 3. Replaced Tex 217-F Part II with Tex 406-A (Concrete Decant Test).
7. 302.2.A. Table 3. Added Tex 410-A Los Angeles Abrasion requirement of 40 for Limestone Rock Asphalt.
8. 302.2.A. Table 3. Tex 461-A Micro Deval not for acceptance, but as an indicator for further investigation.
9. 302.2A. Table 3. Tex 411-A took out remark "as shown on plans."
10. 302.2.A. Table 3. Took out requirement for Unit Weight Tex 404-A to be within 6 percent of the acceptance sample.

11. 302.2A.4. Added that “each source” would meet Table 3 requirements.
12. 302.2.B.1.a. Added wording to allow precoat to be removed and aggregate tested when aggregate quality is questioned.
13. 302.2.B. Replaced AC content with optional Engineer selected target value +/- 0.3% tolerance. Specified Ignition Furnace Tex 236-F.
14. 302.4 (Old spec). Took out provisions for 99.5 – 100 on 200 Sieve – not needed if using Concrete Decant.
15. 302.5 (Old spec). Took out equipment mixing requirements. Not concerned with how it is precoated.

Item 305, “Salvaging, Hauling, and Stockpiling Reclaimable Asphalt Pavement”

1. None.

Item 310, “Prime Coat”

1. Combined Items 310 and 312.
2. Eliminated "cutback asphalt”; used "bituminous."
3. "Blotter" is used in lieu of sand, native sand, base sweepings, etc.
4. Item 316 is referenced for equipment requirements.
5. Optional (Engineer's) requirement to pneumatic roll freshly applied prime to facilitate penetration has been added.
6. Blotter material will not be paid for separately; included in the bid price for prime coat.

Item 314, “Emulsified Asphalt Treatment”

1. None

Item 315, “Fog Seal”

1. Changed the Item title from “Emulsified Asphalt Seal” to “Fog Seal.”
2. Added sand to blot excess asphalt and maintain ingress and egress.

Item 316, “Surface Treatments”

1. Included an option by plan note for the use of variable nozzles on spraybar. Wording is open enough to allow the use of either variable nozzles furnished by the Contractor or the Bearcat double bar distributor.
2. Calibration
   a. Changed requirement for 3 year tank calibration to 5 years when measurement for pay is by volume.
   b. Added requirement that Contractor documents that the spraybar and nozzle combination have been checked in accordance with Tex-99-K, Part III (bucket test). Had some requests from TxDOT personnel to require Contractor to furnish test report for bucket test.
3. Defaulted rollers to light weight pneumatic.
4. Require Contractor to furnish documentation on the volume of the haul trucks.
5. Added equipment requirement for vehicle with DMI. Needed for requirement that Contractor set the shots lengths.
6. Incorporated Special Provision 316-004 requiring higher air and surface temperature requirements for all modified asphalt cement binders.
7. Incorporated air and surface temperature requirements, as approved, for wintertime asphalts.
8. Changed requirement to cover buttons, to when required by plan note.
9. Added rquirement that Contractor set shot and rock land lengths.
10. Max shot width set to width of current transverse distribution test report or width of aggregate spreader box, which ever is less, but may not encroach on traffic.
11. Changed the selection of application temperature from Engineer selecting to Contractor selecting with approval from the Engineer.
12. Added limitations for asphalt application to require traffic control and aggregate for each shot to be

loaded and in place before shot begins.

13. Included wording on actions to be taken for nonuniform asphalt application, which includes checking emulsion viscosity.
14. Included provision for test strips.
15. Added a minimum number of passes, specified enough rollers to cover mat in one pass, and specified staggered rolling pattern.
16. Removed paying for stockpiled aggregate.
17. Removed paragraph pertaining to driveways and turnouts which referenced Item 530.

Item 318, "Hot Asphalt-Rubber Surface Treatments"

1. Materials.
   a. Added Hot Asphalt-Rubber. Required a blend design for Type II or III as designated in Item 300.
   b. Removed gradation requirement for Crumb rubber. Let material requirements in Item 300 dictate rubber gradation based on blend design.
   c. Defaulted surface aggregate class to "B" unless otherwise shown on plans.
   d. Removed requirements for diluent. It is not used.
   e. Took out requirements for extender oil. This is addressed by requiring a blend design and meeting the asphalt-rubber requirements specified.
2. Equipment
   a. Added requirements for optional use of micro-motion flow meters and calibration requirements if they are used for payment.
   b. Defaulted rollers to medium weight pneumatic and removed flat wheel roller.
   c. Required Contractor to furnish documentation on the volume of the haul trucks.
   d. Added equipment requirement for vehicle with DMI. Needed for requirement that Contractor set the shot lengths.
3. 318.4. Construction
   a. Added the ability for TxDOT to supply aggregate.
   a. Removed recipes for mixing and referred to blend design and required project batch testing.
   a. Added statement about removing buttons when shown on plans.
   a. Require that Contractor set shot and rock land lengths.
   a. Shot width must be adjusted so as not to encroach on traffic.
   a. Added limitations for asphalt application to require traffic control and aggregate for each shot to be loaded and in place before shot begins.
   a. Expanded requirement for test sections.
   a. Included wording on actions to take for non-uniform asphalt application.
   a. Added a minimum number of passes, specified enough rollers to cover mat in one pass, and specified staggered rolling pattern.
4. Added measurement and payment provisions for Load, Haul, and Distribute for use if TxDOT supplies aggregate.

Item 320, "Equipment Hot Mix Asphalt Materials"

1. This is a new specification to be referenced by other mix items (330, 334, 340, 341, 342, 344, 346).

Item 330, "Limestone Rock Asphalt Pavement"

1. Combined Item 330 (Class A LRA) and Item 332 (Class B LRA) into one specification.
2. Removed Class A and Class B terminology and replaced by Type I (consists entirely of native LRA aggregate) and Type II (consists of a blend of native LRA aggregate and Virgin aggregates).
3. 330.2. Materials.
   a. Removed polish value requirements and included minimum surface aggregate classification requirements under the Aggregate Quality Monitoring Program (AQMP) listed in the Bituminous Rated Source Quality Catalog.
   b. Added requirement for testing organic impurities for fine aggregates.

c. Changed average bitumen content range for LRA fine aggregate from (5.0 to 9.0) to (5.0 to 8.5) percent by weight of naturally impregnated asphalt.
d. Updated LRA aggregate requirements in Table 1 to reflect current practices.
e. Included Micro-Deval requirements as an indicator test in conformance with other hot-mix specifications.
f. Added Table 2 defining Fluxing Material requirements (flux and aromatic oil). Removed reference to Item 300.
g. Tack Coat. Added CSS-1H, SS-1H, or minimum high temperature grade of PG 58 requirement. Added note not to dilute emulsified asphalts at the terminal, in the field, or at any other location before use.
h. Additives. Added to QCP requirements. Provided the opportunity to add lime (to the virgin aggregates) or antistripping agents in accordance with Item 301.

4. 330.3 Equipment.
a. Added reference to Item 320, "Equipment for Asphalt Concrete Pavement."
b. Cold Aggregate Bins and Proportioning Devices. Removed bin requirements for each type of mixture. These requirements will be provided as part of the QCP.
c. Removed reference to Scales, Motor Grader and Straightedges and Templates.

5. 330.4 Construction.
a. Added Quality Control Plan (QCP).
b. Stockpiling of Aggregates and LRA. Added requirement to provide LRA or aggregate stockpiles for a minimum of 2 days' production before beginning plant operations. Added requirement of maintaining at least a 2-day aggregate supply through the course of the project unless otherwise directed.
c. Storage and Heating of Fluxing Material. Removed reference to Item 300 for heating and added reference to manufactures recommendation.
d. Job-Mix Formula. Removed Engineer from furnishing mixture design and made this a responsibility of the Contractor.
e. Mixing. Removed requirement to add distillate (defined as diesel) to improve winter stockpiling.
f. Paving Mixtures. Slightly modified Master Grading requirements to reflect current practices.
g. Added test procedures and values in Tables 3 through 6 to reflect current practices.
h. Removed 4.0% maximum water content value and added that mixture should leave the plant in workable condition.
i. Added provision that materials should remain workable in the stockpile for at least 6 months.
j. Change water and light hydrocarbon volatiles content from maximum of 4.0% to 5.5%.
k. Added test method Tex-530-C (Boil Test) to Table 5 with a limit of 10%. This value may be increased or eliminated when shown on the plans.
l. Proportioning. Removed limits and added revised limits to Table 4.
m. Placement Operations. Added wording about Weather Conditions consistent with other hot-mix specifications.
n. Tack Coat. Changed tack coat rate from not to exceed 0.05 gal/sy to 0.04 to 0.10 gal/sy. Added new test method (Tex-243-F) to verify that the tack coat has adequate adhesive properties.
o. Compacting. Removed reference to Subarticle 340.6.(5).
p. Compaction. Removed requirements for furnishing specific types of rollers. Added that the contractor will furnish the type, size and number of rollers required to achieve compaction in accordance with rolling patterns.
q. Added Irregularities article consistent with other hot-mix specifications.
r. Added requirement that Type A ride requirements apply to all surfaces, unless otherwise shown on the plans.

6. 330.5 Measurement.
a. Added reference to Item 520, "Weighing and Measuring Equipment."
b. Volumetric Method. Changed value of 'Y' from 4.0% to 5.5% consistent with Table 5.

7. 330.6 Payment.
a. Added pay adjustment for ride quality in accordance with Item 585, "Ride Quality for Pavement

Surfaces."

Item 334, "Hot-Mix Cold-Laid Asphalt Concrete Pavement"

1. Added Quality Control Plan

2. 334.2. Materials.

a. Removed polish value requirements and included minimum surface aggregate classification requirements under the Aggregate Quality Monitoring Program (AQMP) listed in the Bituminous Rated Source Quality Catalog.

b. Changed definition of coarse aggregate to reference No. 8 sieve instead of No. 10 sieve in conformance with other hot-mix specifications.

c. Removed Lightweight Aggregate requirements in Table 1.

d. Added requirement for testing organic impurities for fine aggregates.

e. Tack Coat. Added CSS-1H, SS-1H, or minimum high temperature grade of PG 58 requirement. Added note not to dilute emulsified asphalts at the terminal, in the field, or at any other location before use.

3. Added operational tolerance for asphalt binder of ± 0.3% to Table 7.

4. 334.3 Equipment

a. Mixing Plants. Removed bin requirements for each type of plant

b. Removed reference to Scales, Motor Grader and Straightedges and Templates.

5. 334.4 Construction.

a. Mixture Design. Removed Engineer from furnishing mixture designs and made this a responsibility of the Contractor.

b. Added provision that materials should remain workable in the stockpile for at least 6 months.

c. Job Mix Formula (JMF) Approval. Added that the mixture can be approved from a trial batch.

d. Modified Master Grading requirement to reflect new sieve sizes.

e. Added test method Tex-530-C (Boil Test) to Table 5 with a limit of 10%. This value may be increased or eliminated when shown on the plans.

f. Production Operations. Added requirement to provide aggregate stockpiles for a minimum of 2 days' production before beginning plant operations. Added requirement of maintaining at least a 2-day aggregate supply through the course of the project unless otherwise directed.

g. Placement Operations. Added wording about Weather Conditions consistent with other hot-mix specifications.

h. Tack Coat. Changed tack coat rate from not to exceed 0.05 gal/sy to 0.04 to 0.10 gal/sy. Added new test method (Tex-243-F) to verify that the tack coat has adequate adhesive properties.

e. Compaction. Removed requirements for furnishing specific types of rollers. Added that the contractor will furnish the type, size and number of rollers required to achieve compaction in accordance with rolling patterns.

f. Added Irregularities article consistent with other hot-mix specifications.

g. Added requirement that Type A ride requirements apply to all surfaces, unless otherwise shown on the plans.

6. 334.5 Measurement.

a. Added reference to Item 520, "Weighing and Measuring Equipment."

7. 334.6 Payment.

a. Removed 334.8(2) and 334.8(3). Added pay adjustment for ride quality in accordance with Item 585, "Ride Quality for Pavement Surfaces."

Item 340, "Dense Graded Hot Mix Asphalt (Method)"

1. This Item was completely rewritten same as the method specification for Item 341. The following changes are in reference to Item 341 rather than the existing Item 340.

2. All the QCQA requirements are removed.

3. The reporting schedule and Quality Control Plan (QCP) requirements are not included.

4. Obtaining a thermal profile for lay-down operations is removed.

5. Ordinary compaction control definition and requirements has been added.
6. No acceptance plan has been defined for this item.

Item 341, "Dense Graded Hot Mix Asphalt (QCQA)"

1. This Item was completely rewritten as a QC/QA specification. The following changes are in reference to SS 3146 rather than the existing Item 340.
2. Made the Contractor responsible for performing "non Quality Monitoring (QM)" aggregate tests.
3. Added the Micro-Deval test for coarse aggregate.
4. Dropped all reference to polish value. Added surface aggregate classification requirement.
5. Allows the use of agricultural fine, crusher fines, hydrated lime, cement or fly ash as mineral filler.
6. Added wording to say - "Do not dilute emulsified or cut back asphalts at the terminal, in the field or at any other location before use."
7. Added wording to say - "Do not add lime directly into the mixing drum of any plant where lime is removed through the exhaust stream unless the plant has a baghouse or dust collection system that re-introduces the lime back into the drum."
8. Test Method Tex-242-F (Hamburg) is required for design and production verification on all mixtures.
9. Refers to Item 320 "Equipment for Production, Hauling and Placement of Asphalt Material."
10. Added requirement for Contractor to supply a quality control plan.
11. Changed aggregate gradation requirements on A, B, C, D, & F mixes to reflect AASHTO sieve sizes. Example: #8 sieve is used rather than #10. Values were interpolated.
12. Increased the allowable % passing the #200 sieve by 1%.
13. Added maximum tensile strength requirement to prevent overly stiff mixtures.
14. Tied the number of passes in the Hamburg test to the PG binder grade.
15. Allowed for sharing of gyratory compactors.
16. Allow Contractor to supply Hamburg results on the mixture design.
17. Require trial batch to pass Hamburg test.
18. Only the Contractor is allowed to request referee testing.
19. Reduced allowable differences between contractor and department testing results to make it easier for the Contractor to request referee testing.
20. Percent passing #200 may exceed master grading limits without automatic shut down provisions.
21. No longer allow solvent extraction to be used. Ignition oven, belt sampling, and nuclear AC gauge allowed.
22. Made provision for testing the moisture content of the mixture at the Engineer's discretion.
23. Mix produced in excess of 350F will not be paid for nor placed on Department projects.
24. Added wording - When a release agent is necessary, use a Department approved release agent to coat the inside bed of the truck.
25. Added a table (Table 8) with suggested lift thicknesses and minimum core heights that are eligible for testing.
26. Added - Place mixture when the roadway surface temperature is 60^{o}F or more unless otherwise approved.
27. Added - Unless otherwise approved, apply tack coat uniformly at a rate between 0.04 and 0.10 gal. residual asphalt per square yard of surface area.
28. Added - The Engineer may use Test Method Tex-243-F to verify that the tack coat has adequate adhesive properties.
29. Added- Thermal Profile. For each sublot, obtain a thermal profile using Tex 244 F. The Engineer may also obtain as many thermal profiles as deemed necessary. If the temperature differential is greater than 25°F, the area will be deemed as having thermal segregation. Evaluate areas with thermal segregation by performing a density profile in accordance with Section 341.4.I.3.c(2), "Segregation (Density Profile)." Take corrective action to eliminate areas that have thermal segregation. Unless otherwise directed, suspend operations if maximum temperature differential exceeds 50°F. Resume operations when the Engineer determines that subsequent production will meet the specifications.
30. In lieu of requiring insulated truck beds, provisions were added to limit the minimum temperature

of the mixture (both surface and internal) prior to placement.

31. Added provision to allow referee testing for all mixture subject to "removal and replacement" regardless of difference between the Contractor's and Engineer's test results.

32. Lot 1 is always 1,000 tons to allow for setting rolling patterns etc.

33. At the beginning of the project, the Engineer will select random numbers for all production lots.

34. For each lot, the Engineer will randomly select and test at least 1 sublot. The location of the Engineer's sample will not be disclosed to the Contractor.

35. Contractor is required to take an asphalt binder sample for each sublot of hot mix.

36. Several changes were made to the production testing frequency (Table 10).

37. Added – When required by the Engineer, suspend production when either the Contractor's or the Engineer's test results, for gradation on any individual sieve, exceed the operational tolerances for 3 consecutive sublots. The 3 consecutive sublots may be from more than 1 lot. A sublot will be considered out of tolerance for gradation if any sieve is out of tolerance.

38. Added - The Engineer may perform a Hamburg Wheel test at any time during production including when the boil test indicates a change in quality from the materials submitted for JMF1.

39. Changed definition of a placement lot. Added - A placement lot consists of 4 placement sublots. A placement sublot consists of the area placed during a production sublot.

40. Added - no placement penalty will be assessed for any sublot placed in Lot 1, when the in-place air-voids are greater than or equal to 2.7% and less than or equal to 9.9%.

41. Changed wording to say - Shoulders and ramps are subject to in-place air-void determination and pay adjustments unless otherwise shown on the plans.

42. Added - At the beginning of the project, the Engineer will select random numbers for all placement sublots.

43. Made provisions to allow Contractor to take cores immediately after each placement sublot is completed.

44. Added - If an adequate bond does not exist between the current and underlying layer, take corrective action to insure that an adequate bond will be achieved during subsequent placement operations.

45. Added provisions to require 6" cores except for on Type D and F mix.

46. Changed wording on trimming of cores. If it gets trimmed it gets tested …….. Do not trim the cores before delivering to the Engineer if electing not to include the pair of cores in air-void determination. The placement pay factor for that sublot will be 1.000.

47. Requirements were added to require density profiles to be run to check for segregation.

48. No bonus will be paid on mix failing the density profile.

49. Joint density requirements were added.

50. Irregularities definitions were expanded. Irregularities also include a provision to test for burned asphalt.

51. Changes were made to the production and placement pay adjustment tables (tables 12 & 13). Placement pay adjustments were tightened considerably.

52. Provisions were made to perform Hamburg testing on mix failing the lab density requirements (eligible for removal and replacement). The production sublot is paid at 70% if it passes the Hamburg test.

53. Placement sublots eligible for removal and replacement are retested by obtaining additional two cores within 3 feet of the original cores.

54. Various changes were made pertaining to Certification requirements (Appendix A).

Item 342, "Permeable Friction Course"

1. This is a new specification that incorporates Porous Friction Course (SS 3231) and Crumb Rubber "Plant Mix Seal". Item #342 was reused from the 1993 specification; however, there are numerous differences between plant mix seal and Permeable Friction Courses (PFC). This is not a QCQA specification; however, it is written with language similar to Items 340, and 346.

Item 344, "Performance-Designed Mixtures"

2. This is a new specification that incorporates Superpave (SS 3241), Stone Filled HMACP (SS 3249)

and CMHB (SS 3146). All significant changes listed above for Item 341 apply to Item 344 with the exception of 1 and 45.

3. Added - In addition to meeting the certification requirements in Appendix A, all Level II, certified specialists must successfully complete an approved Superpave (SP) training course.
4. Added - no placement penalty will be assessed for any sublot placed in Lot 1, when the in-place air-voids are greater than or equal to 2.7% and less than or equal to 9.0%.
5. Added provisions to require 6" cores except for SP-C, SP-D, and CMHB-F mixtures, 4-in.
6. Added a provision to design and place a "Rich Bottom Layer" as part of a perpetual pavement design.

Item 346, "Stone Matrix Asphalt"

1. This is a new specification that incorporates existing SMA and Heavy Duty SMA (SS 3248) specifications as well as what was Crumb Rubber hot mix. All significant changes listed above for Item 340 apply to Item 346 with the exception of 1, 26, 40, and 45.
2. Refers to DMS 9204 which allows either cellulose or mineral fibers.
3. Added - In addition to meeting the certification requirements in Appendix A, all Level II, certified specialists must successfully complete an approved Superpave (SP) training course.
4. Added - Place mixture when the roadway surface temperature is 70^{o}F or more unless otherwise approved.
5. Added - no placement penalty will be assessed for any sublot placed in Lot 1, when the in-place air-voids are greater than or equal to 2.7% and less than or equal to 8.0%.
6. Added provisions to require 6" cores.

Item 350, "Microsurfacing"

1. Deleted the CSS-1P emulsion requirements and refer to the Item 300 specification.
7. Deleted the polish value requirements and included the WWARP requirements.
8. Will allow either cement or hydrated lime mineral filler at the contractor's option.
9. Reorganized the design requirements under a Job Mix Formula section.
10. Reorganized the current spec so that all equipment requirements are under the Equipment section.
11. Added a thermometer requirement to record temp continuously on asphalt storage equipment.
12. Added verbiage to cease operations under adverse weather conditions.
13. Reorganized the mix testing requirements in the Production Testing section under Const. Methods.
14. Added verbiage to use a rigid secondary strike off plate under the Rut section.

Item 351, "Repairing Existing Flexible Pavement Structure"

1. 1993 Item 351 "REPAIRING EXISTING FLEXIBLE PAVEMENT STRUCTURE"
2. Added Limestone Rock Asphalt, (Item 330) as a possible base material.

Item 354, "Planing and Texturing Pavement"

1. Added manual system for planing in areas restricted to self-propelled access and for detail pavement removal.

Item 356, "Fabric Underseal"

1. Combinded existing Item 356, "Fabric Underseal" with Special Specification 3031, "Fabric Joint Underseal."

Item 358, "Asphalt Concrete Surface Rehabilitation"

1. Changed philosophy to contractor-designed mix to restore mixture to mix and binder properties shown in the plans. The Engineer is not required to design the mixture, conduct any design testing for the contractor, or made any material decisions for the contractor.
2. Raised allowable temperature behind the scarifier to 325 F.

Item 360, "Concrete Pavement"

1. The specification has been reorganized with the number of "Articles" reduced from 16 to 6. Consolidated many of the construction-related articles into a single "Construction" article.
2. "Portland Cement Concrete" changed to "Hydraulic Cement Concrete" to reflect the increased usage of fly ash and GGBF. Replaced Class "K" concrete with Class "HES" (High Early Strength concrete) to eliminate confusion over requirements.
3. Materials moved to TxDOT-DMS specifications:
   Curing Materials and Evaporation Retardant moved to DMS-4650, "Hydraulic Cement Concrete Curing Materials and Evaporation Retardants"
   Epoxies moved to DMS-6100, "Epoxies and Adhesives"
   Joint Sealants and Fillers moved to DMS-6310, "Joint Sealants and Fillers"
4. Strength requirement for mix design and job control have been reduced. Compression testing is permitted for both mix design and job control.
5. Location of some material requirements have been moved from other Items to Department Materials Specifications, i.e., joint sealants and fillers and curing materials.
6. Curing application equipment and tine texturing equipment can be mounted on same piece of moving equipment, if production remains adequate.
7. The requirement for a "Paving Plan" has been expanded to become a "Paving and Quality Control Plan". The default is for the contractor to perform strength, slump and air content job control tests, including providing certified personnel, making specimens, transporting, testing, and providing the calibrated test equipment. Test schedule has been included with Engineer direction and option to witness operations. Per FHWA request, included 1:10 verification testing by TxDOT.
8. Paving operations will cease if the contractor is unable to identify, document and correct problems with deficient strengths. Remove and replace structurally deficient concrete pavement.
9. Contractor will imprint date at beginning and end of each placement. Contractor may also imprint name or logo with date.
10. Metal tine texturing is required unless otherwise shown on the plans. This allows the districts to delete this requirement on lower speed roadways and reflects intent to eliminate the statewide federally mandated requirement for tining.
11. Maintain a supply of materials to cover and protect fresh concrete pavement surface from damage (rain).
12. Early opening to traffic. Eliminated option to automatically open pavement to 14,000 lb. vehicles of the Contractor after 4 days. Now opens to all traffic after 3 curing days based on an early opening strength being met, either with maturity strength estimates, or with laboratory specimens and curing days. Definition of curing day changed from calendar day to 24-hour period and coordinated with Item 420.
13. Very early opening to construction equipment. May open after two days to Contractor's paving equipment and paving materials delivery equipment, based on reaching opening strength using maturity.
14. Repair damaged curing membrane after placement.
15. Contractor responsible for all testing for early opening (strength specimens & maturity testing)

Item 361, "Full-Depth Repair of Concrete Pavement"

1. Use Class "HES" when the timeframe for opening to traffic is specified to be within 72 hours of placement. Otherwise, use Class "P" in accordance with Item 360.
2. Stabilized Base Material heading was changed to Base Material because not all base material allowed is stabilized. Eliminated the listing of all Items that could be used as base material so the base material required now needs to be shown on the plans. Default is to use concrete.
3. Added DMS 6100 to cover Epoxy material because Item 575 is going away.
4. Eliminated Miscellaneous materials because it should already be covered because we included Item 360 in the pertinent material list.
5. Changed the repair area width from a full lane width to half lane width to address the maintenance special provision which allows half lane width repairs.

6. Did away with the pressure relief sawing. Felt that this is a contractor problem if the saw blade get bound up and it would automatically be done to release a bound up saw blade.
7. Eliminated the tiebar bond test since we specify the epoxy to be used and we added the requirement that the tiebar hole be filled with epoxy before installing the tiebar. Field observation of the methods presently being used are not satisfactory. Tiebars are now often being dipped into the mixed epoxy and then inserted in the hole with a gob of epoxy on a portion of the 12 inch inserted portion. The bar is usually not even coated the full 12 inch insertion length.
8. Require curing mats for temperature control if repair is to be opened within 72 hours and air temperature gets below 70 F.

Item 368, "Concrete Pavement Terminals"

1. This Item makes significant use of other items that have been significantly revised, particularly Items 360 and 421.
2. Item has been rewritten as a more generic specification to include concrete pavement terminals with the Wide Flange Beam system, developed by HOU, and the expansion joint system that DAL developed. This is in addition to retaining the terminal anchor lugs shown in the statewide standard details sheets TA (CP)-99, "Terminal Anchorage for Concrete Pavement". Details for all methods will be provided on statewide or district standard detail sheets.
3. Very early opening to construction traffic to expedite construction at two days and early opening to public traffic at three days permitted in accordance with the revised Item 360, "Concrete Pavement" and the use of the maturity method or additional laboratory strength specimens.
4. Location of some material requirements have been moved from other Items to Department Materials Specifications, i.e., joint sealants and fillers and curing materials.